

Process for Developing the Northern Spotted Owl Abiotic Model.

Objective:

To develop a tool managers can use to identify locations on the landscape to promote northern spotted owl (NSO) activity centers by identifying and modeling abiotic factors associated with known activity centers.

Process Overview:

Data is compiled from a number of abiotic variables at three spatial scales centered on known activity centers and at least an equal or greater number of unused (or random) sites. The abiotic variables could include: distance to stream, distance to road, slope position, slope percent, 7th field watershed position, elevation, aspect and curvature. Activity centers include the sample of known spotted owl nest sites. One could also parameterize the model on non-nest sites as well. For this analysis, choose the sites that have a long history of survey data that allows a high level of confidence sites are used as activity centers versus sites not used. The data is then analyzed to determine which variables are significantly different between used and unused sites. For variables that are significantly different, values corresponding to the 50th percentile around the mean should be calculated. Corresponding values are then identified in the project area and color coded on a map. A different color is assigned depending on the number of variable values that overlap.

Data Collection:

Data is collected at three spatial scales (70, 140, and 500 acre circles or as determined by local data) centered on known and random sites. These spatial scales are selected because they represent the average size of a NSO nest stand, the average size of a NSO core area (500 acres) and an intermediate value. Data at each spatial scale is compiled pixel by pixel using a moving window across the landscape. Thus, data generated for each pixel is based on the acres surrounding that pixel at the identified scale. Several statistics for each variable including mean, median, sum, minimum, and maximum are generated.

Data Exploration and Analysis:

Prior to analysis all data should be evaluated for normality and homogeneity of variance and transformed as needed. To determine which scale to conduct analysis, look at the confidence intervals for the sample means for all variables at the different spatial scales. Where the confidence intervals are the smallest, use this data.

Model and Map Development:

The next step involves identifying where the significantly different variables occur in the project area and plotting these areas on a map. This involves calculating the values for the 50th percentile around the mean for the activity centers. Using GIS software, a 500 acre moving window analysis is conducted pixel by pixel across the project area. At each pixel statistics for the significantly different variables are calculated for the 500 acres surrounding that pixel. Then each pixel is reclassified with a 0 or 1 for each variable based on whether the mean for the 500 acre window included the 50th percentile values.

identified for a given variable. Pixels are then assigned a color based on the sum of these rasters. The final map product identifies and prioritizes specific areas in the project area to promote and develop future activity centers based solely on abiotic factors.